

WHAT IS CLAIMED IS:

- 1 1. An apparatus for removing a forming element from a concrete
2 pipe, the apparatus comprising:
3 a support member; and
4 a removal device including first and second elements, the first
5 element being attachable to the forming element and having a stop, the second
6 element being supported by the support member such that the second element is
7 swingable with respect to the support member, the second element further being
8 engageable with the stop so as to apply a force to the first element for removing the
9 forming element from the concrete pipe.
- 1 2. The apparatus of claim 1 wherein the first element is a guide
2 element that is configured to guide movement of the second element.
- 1 3. The apparatus of claim 1 wherein the first element includes
2 a channel that receives at least a portion of the second element.
- 1 4. The apparatus of claim 1 wherein the second element has an
2 I-shaped cross-section.
- 1 5. The apparatus of claim 1 wherein the second element includes
2 a cylindrical body that receives the first element.
- 1 6. The apparatus of claim 1 wherein the first element has a first
2 generally rectangular cross-section, the second element has a second generally
3 rectangular cross-section, and the first element extends through the second element.
- 1 7. The apparatus of claim 1 further comprising two cables
2 connected between the support member and the second element for allowing the
3 second element to swing with respect to the support member.

1 8. The apparatus of claim 1 further comprising two chains
2 connected between the support member and the second element for allowing the
3 second element to swing with respect to the support member.

1 9. The apparatus of claim 1 wherein the first element is
2 supported by the support member.

1 10. The apparatus of claim 9 wherein the support member
2 includes a support frame and a trolley that is laterally movable with respect to the
3 support frame, and wherein the first and second elements are supported by the
4 trolley such that the first and second elements are laterally movable with respect to
5 the support frame.

1 11. The apparatus of claim 9 wherein the trolley includes a base
2 and a support beam removably attached to the base such that the support beam may
3 be adjusted laterally with respect to the base, and wherein the first and second
4 elements are supported by the support beam.

1 12. The apparatus of claim 1 further comprising a hoist supported
2 by the support member and attachable to the forming element, the hoist being
3 configured to control movement of the forming element after the forming element
4 has been removed from the concrete pipe.

1 13. The apparatus of claim 12 wherein the support member
2 includes a support frame and a support arm pivotally connected to the support
3 frame, wherein the hoist is movably attached to the support arm.

1 14. An apparatus for removing a forming element from a concrete
2 pipe, the apparatus comprising:
3 a support member;
4 a guide element suspended from the support member and attachable
5 to the forming element, the guide element having a guide channel and a stop
6 disposed at a distal end of the guide channel; and

7 a pendulum element having an I-shaped cross-section and being
8 suspended from the support member such that the pendulum element is swingable
9 with respect to the support member, the pendulum element being movable along at
10 least a portion of the guide channel and being engageable with the stop so as to
11 apply a force on the guide element, thereby causing the guide element to apply a
12 removing force on the forming element.

1 15. A method of removing a forming element from a concrete
2 pipe, the method comprising:
3 attaching a guide element to the forming element, the guide element
4 having a stop; and
5 swinging a pendulum element such that the pendulum element
6 engages the stop and applies a force on the guide element, thereby causing the guide
7 element to apply a removing force on the forming element.

1 16. The method of claim 15 wherein the guide element has a guide
2 channel that receives at least a portion of the pendulum element as the pendulum
3 element swings.

1 17. The method of claim 15 wherein the pendulum element has
2 an I-shaped cross-section.

1 18. The method of claim 15 wherein the pendulum element
2 includes a cylindrical body, and the guide element extends through the cylindrical
3 body.

1 19. The method of claim 15 wherein the guide element and the
2 pendulum element each have a generally rectangular cross-section, and the guide
3 element extends through the pendulum element.

1 20. The method of claim 15 wherein the pendulum element is
2 supported by a support member such that the pendulum element is swingable with
3 respect to the support member.

1 21. The method of claim 20 wherein the guide element is also
2 supported by the support member.

1 22. The method of claim 15 further comprising adjusting swing
2 weight of the pendulum element.

1 23. An apparatus for separating a first object from a second
2 object, the apparatus comprising:
3 a support member; and
4 a removal device including first and second elements, the first
5 element being attachable to the first object and having a stop, the second element
6 being supported by the support member such that the second element is swingable
7 with respect to the support member, the second element further being engageable
8 with the stop so as to apply a force to the first element for separating the first object
9 from the second object.

1 24. The apparatus of claim 23 wherein the first element is a guide
2 element that is configured to guide movement of the second element.

1 25. The apparatus of claim 23 wherein the first element includes
2 a channel that receives at least a portion of the second element.

1 26. The apparatus of claim 23 wherein the second element has an
2 I-shaped cross-section.

1 27. The apparatus of claim 23 wherein the second element
2 includes a cylindrical body that receives the first element.

1 28. The apparatus of claim 23 wherein the first element has a first
2 generally rectangular cross-section, the second element has a second generally
3 rectangular cross-section, and the first element extends through the second element.

1 29. The apparatus of claim 23 further comprising two cables
2 connected between the support member and the second element for allowing the
3 second element to swing with respect to the support member.

1 30. The apparatus of claim 23 further comprising two chains
2 connected between the support member and the second element for allowing the
3 second element to swing with respect to the support member.

1 31. The apparatus of claim 23 wherein the first element is
2 supported by the support member.

1 32. The apparatus of claim 31 wherein the support member
2 includes a support frame and a trolley that is laterally movable with respect to the
3 support frame, and wherein the first and second elements are supported by the
4 trolley such that the first and second elements are laterally movable with respect to
5 the support frame.

1 33. The apparatus of claim 31 wherein the trolley includes a base
2 and a support beam removably attached to the base such that the support beam is
3 laterally adjustable with respect to the base, and wherein the first and second
4 elements are supported by the support beam.

1 34. The apparatus of claim 23 further comprising a hoist
2 supported by the support member and attachable to the first object, the hoist being
3 configured to control movement of the first object after the first object has been
4 separated from the second object.

1 35. The apparatus of claim 34 wherein the support member
2 includes a support frame and a support arm pivotally connected to the support
3 frame, wherein the hoist is movably attached to the support arm.